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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/524,672

02/28/2007

Heinz Peter Frerichs

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06/03/2010

O'Shea Getz P.C.

1500 MAIN ST. SUITE 912

SPRINGFIELD, MA 01115

EXAMINER

GORDON, MATTHEW E

ART UNIT

PAPER NUMBER

2892

MAIL DATE

DELIVERY MODE

06/03/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/524,672	Applicant(s) FRERICHS ET AL.	
	Examiner MATTHEW GORDON	Art Unit 2892	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 May 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-27, 32 and 33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-27 and 32-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The examiner acknowledges the cancellation of claims 1-15 in the set of claims filed 24 May 2010.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 16-22 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent Pub. 2002-158447 A to *Okada et al.* of record (from hereinafter *Okada*).

Regarding claim 16, *Okada* teaches a multilayer semiconductor sensor (Fig. 1) comprising a first functional layer (Fig. 1d, layer 101, [0018]), a second functional layer (Fig. 1d, layer 108, [0024]), an intermediate layer (Fig. 1d, insulator layer 102, [0019]) disposed between the first (101) and second (108) functional layers in a first predetermined region, and a plurality of anchoring elements (Fig. 1b, post 104, [0020]) each embedded in at least two of the first and second functional layers (101, 108) and the intermediate layer (102) where the anchoring elements (104, made of either Sn, Au, Ag or Pd, [0020]) comprise a different material than that of the first (101, made of Cu, [0052]) and the second (108, made of resin [0024]) functional layers.

Regarding the limitation “semiconductor sensor”, it has been held that a preamble is denied the effect of a limitation where the claim is drawn to a structure and the portion of the

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claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. MPEP 2111.02.

Regarding claim 17, *Okada* teaches the multilayer semiconductor sensor of claim 16, where each of the plurality of anchoring elements (104) is embedded in the second functional layer (108) and in the intermediate layer (108).

Regarding claim 18, *Okada* teaches the sensor of claim 16, where a cross-sectional area of each of the plurality of anchoring elements (304) is cylindrical. (See Fig. 3)

Regarding claim 19, *Okada* teaches the sensor of claim 16, where a cross-sectional area of each of the plurality of anchoring elements (104) increases from one end of the anchoring element to the other end of the anchoring element.

Regarding claim 20, *Okada* teaches the sensor of claim 16, where each of the plurality of anchoring elements (104) has a conical shape.

Regarding claim 21, *Okada* teaches the sensor of claim 16 where the first and second functional layer (101, 108) adjoin each other in a second predetermined region that is outside the first predetermined region. Here the first predetermined region of *Okada* is interpreted as the region directly between the two anchors (104) as shown in Fig. 1. The second predetermined region of *Okada* is interpreted as a region either to the right or left of both anchors (104) as shown in Fig. 1.

Regarding claim 22, *Okada* teaches the sensor of claim 16, where the intermediate layer (102) is adhered to the first functional layer (101).

Regarding claim 27, *Okada* teaches the sensor of claim 16, where the intermediate layer (insulation film 102) comprises a dielectric material.

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Regarding claim 32, *Okada* teaches a multilayer semiconductor (Fig. 1d), comprising a first functional layer (101), a second functional layer (108) coupled to the first functional layer (101), and a plurality of anchoring elements (104) disposed between, and partially embedded in at least one of the first (101) and the second functional (108) layers, where the anchoring elements (104) comprise a different material (either Sn, Au, Ag or Pd) than that of the first (101, made of Cu) and the second (108, made of resin) functional layers.

Regarding claim 33, *Okada* teaches the multilayer semiconductor of claim 32, further comprising an intermediate layer (102) disposed between the first (101) and the second functional layers (108), where the plurality of anchoring elements (104) are partially embedded in the intermediate layer (102).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. Claims 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Okada*.

Regarding claim 23, although *Okada* fails to teach that the diameter of each of the plurality of anchoring elements (104) lies in a range between 100 and 1000 nm, at the time the invention was made it would have been obvious to one of ordinary skill in the art to use the teaching of *Okada* to form the diameter of the anchoring elements in the range as claimed because it has been held that where general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation in order to achieve the desired size. (See MPEP 2144.05)

Regarding claim 24, although *Okada* fails to teach that the spacing between the plurality of anchoring elements (104) lies in a range between 100 and 1000 nm, at the time the invention was made it would have been obvious to one of ordinary skill in the art to use the teaching of *Okada* to form the spacing between the anchoring elements in the range as claimed because it has been held that where general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation in order to achieve the desired size. (See MPEP 2144.05)

Regarding claim 25, although *Okada* fails to teach that each of the plurality of anchoring elements (104) is embedded into the second functional layer (108) at a depth of between 20 and 500 nm, at the time the invention was made it would have been obvious to one of ordinary skill in the art to use the teaching of *Okada* to form the embedded depths in the range as claimed because it has been held that where general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation in order to achieve the desired size. (See MPEP 2144.05)

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Regarding claim 26, although *Okada* fails to teach that the thickness of each of the first and second functional layer (101, 108) lies in a range between 100 and 1000 nm, at the time the invention was made it would have been obvious to one of ordinary skill in the art to use the teaching of *Okada* to form the thicknesses of the functional layers in the range as claimed because it has been held that where general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation in order to achieve the desired size. (See MPEP 2144.05)

Response to Arguments

6. Applicant's arguments filed 17 May 2010 have been fully considered but they are not persuasive.

Applicant's submit that the invention of newly amended claim 1 "where the anchoring elements comprise a different material than that of the first and the second functional layers" overcomes the prior art. This is not held persuasive because a machine translation of *Okada*, upon which the examiner relied for the rejection, teaches that the anchoring elements (104) may comprise a variety of metals (Au, Sn, Pd) different from the first functional layer (Cu) and the second functional layer (resin). (See [0020, 24 and 52])

A copy of the machine translation of *Okada* is being supplied along with this Office action.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW GORDON whose telephone number is (571)270-7432. The examiner can normally be reached on Monday-Friday 9 A.M-5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thao X. Le can be reached on 571-272-1708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Thao X Le/

Supervisory Patent Examiner, Art Unit
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/M. G./

Examiner, Art Unit 2892